

## C L A I M S

1. A device for the accumulation and release of products (P) disposed in ranks, of the type comprising:

- a storage unit (2) with respective receiving (4) and delivery (6) openings for said products,  
5 - a plurality of container elements (7) movably guided within said storage unit (2) between said receiving (4) and delivery (6) openings along a predetermined path (8), each container element (7) being provided with a plurality of support surfaces (9) for containing ranks of products (P),

10 - actuating means being provided to control the movement of said container elements (7) in the storage unit (2) so as to present each container element (7) to be filled in sequence at the receiving opening (4), for loading incoming ranks of products onto the respective support surfaces (9) of the container; and to conduct the previously filled containers to the delivery opening (6) for the release of respective ranks of products leaving the storage unit (2),

characterised in that said actuating means comprise first and second separate control means (10, 11) respectively associated in sequence with one and another container (7) in succession to one another of each pair of containers 20 (7) to be found in said plurality of container elements, so that both of said containers (7) in succession to one another are conducted from and towards said receiving opening (4) and/or delivery opening (6) of the storage unit (2) by independent movements with respect to one another.

2. A device according to claim 1, wherein said first and second 25 control means (10, 11) comprise motor-driven conveyor chains.

3. A device according to claim 2, wherein said first and second control means (10, 11) respectively comprise at least a first (11a, 11b; 11c,

11d) and at least a second (21a, b; 21c, d) pair of chains closed in a ring, the chains of each pair being provided with respective coupling means (16; 26) capable of coupling with respective complementary coupling means (17) provided on said containers (7) for conveying same along at least part of the 5 operative branches of said chains, such that empty containers are conducted, in succession to one another, by both pairs of chains, with independent movements of one container (7) with respect to the other, from and towards said receiving opening (4), for the storage of the products (P) in said containers (7).

10 4. A device according to claim 1 or 2, wherein said first and second control means (10, 11) further comprise at least a third (31a, 31b; 31c, 31d) and respectively at least a fourth (41a, 41b; 41c, 41d) pair of chains closed in a ring and provided with coupling means (16, 26) capable of coupling with respective complementary coupling means (17) on said containers for conveying the containers (7) along at least part of the operative branches of said chains, such that the containers (7) filled with products are conducted, in succession to one another, by both pairs of chains, with independent movements of one container with respect to the other, from and towards the delivery opening (6) for the release of the products (P) from the storage unit 15 (2).

20 5. A device according to claim 3 or 4, wherein said coupling means (16, 26) are disposed at a regular pitch along said at least first (11a, 11b; 11c, 11d) and said at least second (21a, b; 21c, d) pair of chains and, respectively, along said at least third (31a, 31b; 31c, 31d) and said at least fourth (41a, 25 41b; 41c, 41d) pair of chains.

6. A device according to claim 3, wherein said at least first (11a, 11b; 11c, 11d) and said at least second (21a, b; 21c, d) pair of chains have

respective return axes coaxial with one another with the operative branches of each of the pairs of chains parallel and mutually spaced from one another.

7. A device according to claim 4, wherein said at least third (31a, 31b; 31c, 31d) and said at least fourth (41a, 41b; 41c, 41d) pair of chains 5 have respective return axes coaxial with one another with the operative branches of said pairs of chains parallel and mutually spaced.

8. A device according to claim 3, wherein the coupling means provided on said at least first (11a, 11b; 11c, 11d) pair of chains are disposed at an alternating pitch with the corresponding coupling means (26) provided 10 on said at least second (21a, b; 21c, d) pair of chains, so that said container elements (7) are coupled one after the other, alternately by the first and the second pair of chains.

9. A device according to claim 4, wherein the second coupling means (16) provided on said at least third (31a, 31b; 31c, 31d) pair of chains 15 are disposed at an alternating pitch with the corresponding coupling means (26) provided on said at least fourth (41a, 41b; 41c, 41d) pair of chains.

10. A device according to one or more of the preceding claims, wherein the path (8) of movement of the containers (7) in the storage unit (2) is in the shape of a closed ring and comprises a first branch (8a) and a second 20 opposed branch (8b) which are respectively provided at the receiving opening (4) and the delivery opening (6) for said products, said first and second branch (8a, 8b) being connected, in operation, at their respective ends by a respective third (8c) and fourth branch (8d).

11. A device according to claim 10, wherein said first and second 25 branch (8a, 8b) extend transversely to the third (8c) and fourth branch (8d).

12. A device according to claim 10 or 11, wherein at least the first (8a) or the second branch (8b) of the path has a rectilinear configuration.

13. A device according to claim 12, wherein said first (8a) and second branch (8b) have a rectilinear development respectively defined by said at least first (11a, 11b; 11c, 11d) and said at least second (21a, b; 21c, d) pair of chains and by said at least third (31a, 31b; 31c, 31d) and fourth (41a, 41b; 41c, 41d) pair of chains.

14. A device according to one of claims 10 to 13, wherein said third (8c) and fourth branch (8d) have a rectilinear configuration and the path formed by said first, second, third and fourth branches (8a, 8b, 8c, 8d) is quadrilateral overall, with pairs of opposed branches parallel to one another.

15. A device according to claim 14, wherein the path formed by said branches (8a, 8b, 8c, 8d) has a substantially rectangular configuration.

16. A device according to one or more of claims 10 to 15, comprising first conveying means (42) acting on the containers (7) in transit on the third branch (8c) of the path, in order to accumulate in a position one against the other the containers filled along the first branch (8a) of the path.

17. A device according to one or more of claims 10 to 16, comprising second conveying means (50) acting on the containers (7) in transit on the fourth branch (8d) of the path in order to accumulate in a position one against the other the containers (7) emptied along the second branch (8b).

18. A device according to claim 16 and 17, wherein said first and second conveying means (42, 50) respectively comprise at least a fifth and at least a sixth pair of chains (43) parallel to and spaced from one another, and also closed in a ring coaxially with one another, the chains being provided with support rollers (46) for supporting respective opposed lateral ends of the containers.

19. A device according to claim 18, wherein said at least fifth and sixth pair of chains (43) comprise respective pluralities of idle rollers (46),

pivoted on the chain pins, for supporting said containers (7), respective arresting means (49, 49a) being provided at the arrival end of the third (8c) and of the fourth branch (8d) of the path, for arresting the containers (7) in a position one against the other, as a result of the continuous movement of said 5 chains (43).

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